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# Autosomal Recessive Severe Dwarfism in a Sicilian Girl: A New Form of Osteodysplastic Primordial Dwarfism?

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**A new type of osteodysplastic primordial dwarfism is delineated in a 5-year-old female child with severe growth retardation of prenatal onset, gross skeletal changes, a non-Seckel facial phenotype, and presumed autosomal recessive inheritance.**


**KEY WORDS: osteodysplastic primordial dwarfism, growth retardation, autosomal recessive inheritance**

## INTRODUCTION

The term "osteodysplastic primordial dwarfism" (ODPD) refers to a group of skeletal dysplasias with severe growth retardation of prenatal onset, gross skeletal changes, a Seckel-like facial phenotype and autosomal recessive inheritance [Majewski and Spranger, 1976]. Three different types of ODPD have been delineated on the basis of specific clinical and radiological criteria. We now report on a patient whose skeletal abnormalities seem to represent a form of ODPD. The clinical manifestations seem unique and suggest that this is a new clinical/genetic entity.

## CLINICAL REPORT

D.R.L., a 5-year-old girl, was born to young, healthy, first cousin parents. During the pregnancy, the mother's first, intrauterine growth retardation was noted upon ultrasound study in the second trimester. Delivery was spontaneous at term. Birth weight was 1,640 g (50th centile for a 32.5-week newborn), birth length 35 cm (50th centile for a 26-week fetus): OFC was 29.6 cm (50th centile for a 32-week newborn). Thus, the baby was undergrown and disproportionately short for OFC and weight. Growth has been extraordinarily delayed and psychomotor retardation is present. Bone age is severely delayed with lack of ossification of the epiphyses of long bones (stage A TW2 Tanner). At age 5 years, her weight is 4,750 g (mean for 1 month), length is 56,5 cm (mean for 2 months) and OFC 39.5 cm (mean for 3 months; Fig. 1). She has a steep forehead, hypertelorism, depressed nasal bridge, short nose, malar and maxillary hypoplasia, micrognathia, presence of only 4 small incisors, posteriorly angulated abnormal ears, se-


Fig. 1. A 5-year-old girl with extreme dwarfism. **a**: Frontal view. **b**: Profile of the face: note absence of a Seckel-like phenotype with steep forehead and posteriorly angulated ears. **c**: Note bilateral simian creases. (Parts b and c on overleaf)

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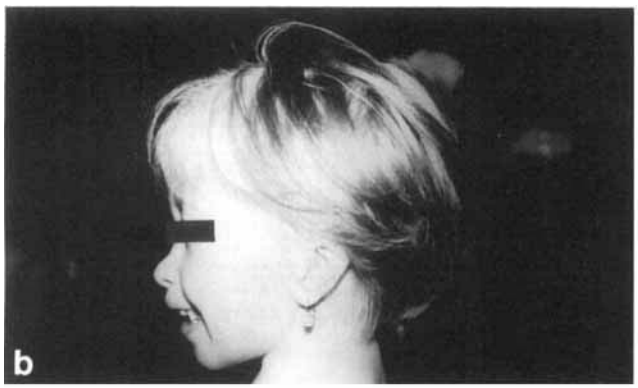


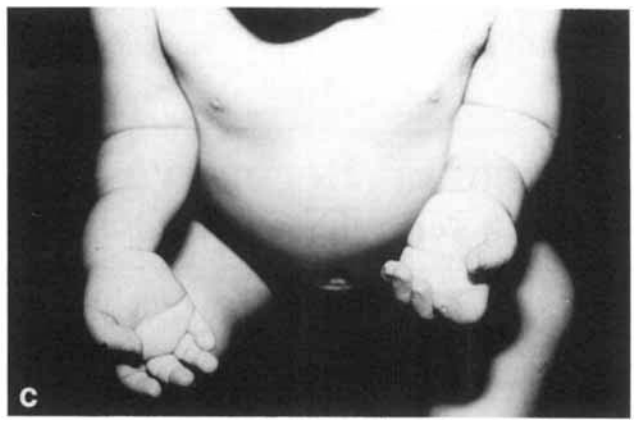


Fig. 1. *Continued.*

vere micromelia with redundant skin, external rotation of the legs, small hands and feet, bilateral simian creases, hypoplastic thumbs, and broad first toes. Psychomotor performance and speech development are delayed. At present she maintains a sitting position and her global developmental age is comparable to that of an 8-month-old child. Radiographs show thin and curved long bones with anterior bowing of femora and tibiae (Fig. 2), shortness of the distal ulna (Fig. 3), bilateral elbow and hip dislocation (Fig. 4), hypoplastic pelvic bones, slender finger bones with short middle and distal phalanges and relatively short first metacarpal and metarsal bones (Fig. 5), severe retardation of all ossification nuclei, a small cranium with frontal bossing and "beaten silver" appearance (Fig. 6), and foreshortened vertebral bodies (Fig. 7). The parents refused performance of a CT or MRI scan of the brain. Abdominal, renal and heart ultrasound studies were nor-

Fig. 2. Thin and slightly curved long bones with metaphyseal irregularities of distal femora and anterior bowing of femora and tibia.

Fig. 3. Note short distal ulna and elbow dislocation.

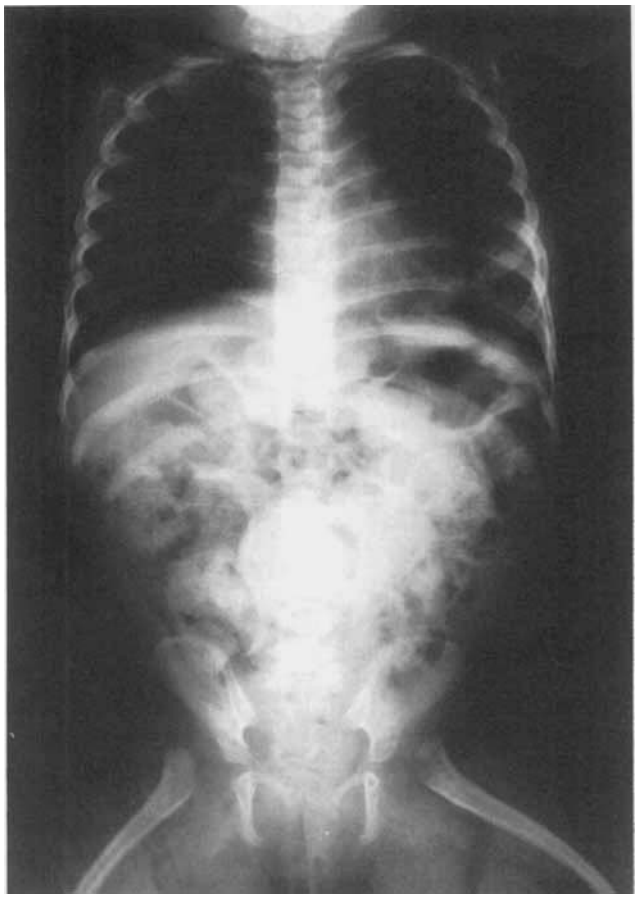

Fig. 4. Note bilateral hip dislocation.

mal. Auditory brainstem responses demonstrated mild bilateral sensorineural hearing loss. EEG demonstrated a bioelectrical immaturity without any specific abnormalities. Karyotype is normal (46,XX).

## DISCUSSION

This patient shows an extreme dwarfism of prenatal onset with skeletal changes compatible with the diagnosis of ODPD. She does not have a Seckel-like phenotype; moreover, in view of the clinical course, the skeletal abnormalities, and presumed autosomal recessive inheritance, we think she can be considered as having a variety of ODPD. Three types of ODPD have previously been described. They can be differentiated on the basis of radiological findings [Majewski et al., 1982a,b; Meinecke and Passarge, 1991; Meinecke et al., 1991; Willems et al., 1987]. ODPD type I is mainly characterized by a severe pelvic hypoplasia, short and bowed humeri and femora, elbow and hip dislocation, short first metacarpals and brachymesophalangy of fingers II–V. ODPD type II presents with a narrow pelvis, coxa vara, flare of the distal metaphysis of ulnae, radii, femora and proximal tibiae, and the same hand abnormalities of ODPD type I. Pseudoepiphyses and epiphysiolysis can be observed. ODPD type III is characterized by platyspondyly, long clavicles, dysplastic pelvis and enlargement of proximal fibula.

Our patient has some skeletal changes of ODPD type I (elbow and hip dislocation, hand abnormalities), some of type II (short distal ulna, narrow pelvis, metaphyseal irregularities of distal femura) and some of type III (long clavicles). Craniosynostosis is rarely reported in ODPD. Other changes, such as the foreshortening of the vertebral bodies, anterior bowing of femora and tibiae with external rotation of legs, short nose, and maxillary hypoplasia, are unique findings in the present case (Table I). The absence of a "bird head" with beaked nose and sloping forehead make it possible to differentiate the present patient from the historical case of Carolina Crachami, the Sicilian Fairy, a bird-headed dwarf described in 1824 [Anonymous, 1824; Bondeson, 1992]. A recent report of some additional cases includes Carolina Crachami in ODPD type III [Majewski, 1992;

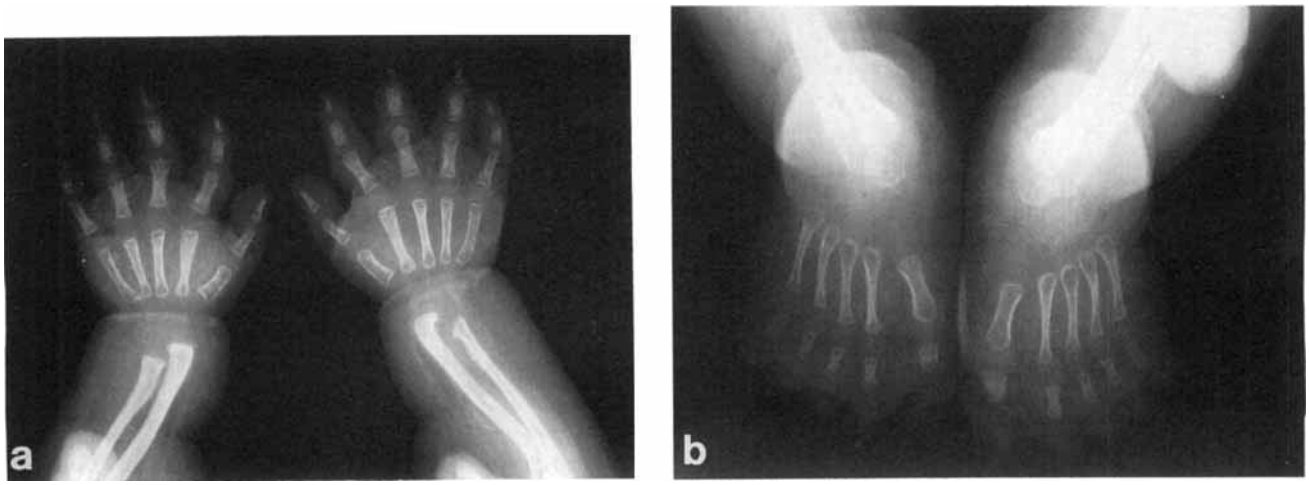


Fig. 5. **a**: Note slender finger bones with short middle and distal phalanges, short first metacarpal bones and absence of carpal bones. **b**: Note metatarsal and finger bones with broad first toes.

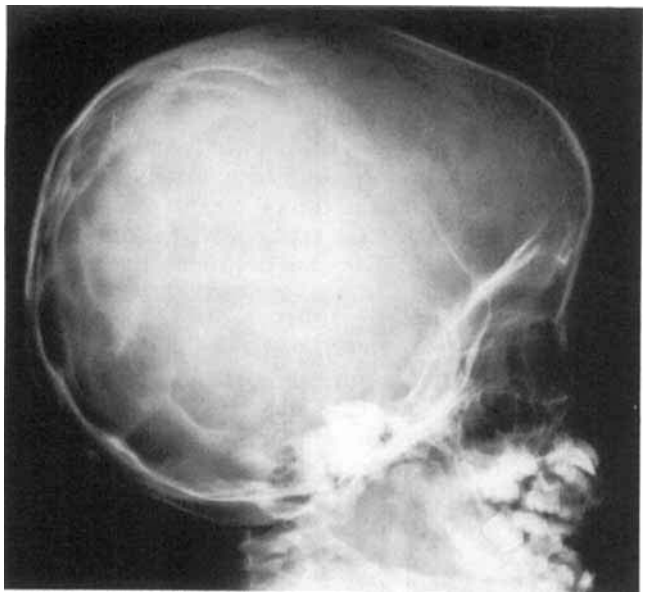

Fig. 6. Small cranium with frontal bossing and presumed increased intracranial pressure.

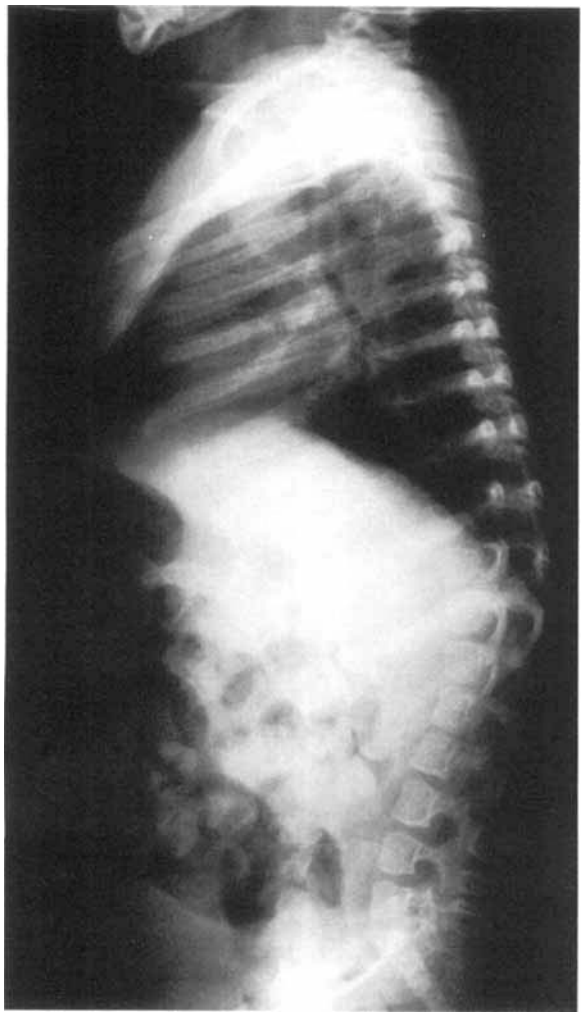

Fig. 7. Spine radiograph lateral view. Note foreshortening of vertebral bodies.

TABLE I. ODPD: Clinical and Radiological Findings

| Finding | Type I | Type II | Type III | P.P.[a] |
|---|---|---|---|---|
| Seckel-like face | +[b] | + | + | − |
| Short nose | − | − | − | + |
| Maxillary hypoplasia | − | − | − | + |
| Severe growth delay | + | + | + | + |
| Bone age delay | + | + | + | + |
| Pelvic hypoplasia | + | + | + | + |
| Brachymelia | + | + | + | + |
| Short bowed humeri | + | + | − | + |
| Short bowed femora | + | + | − | + |
| Elbow dislocation | + | − | − | + |
| Hip dislocation | + | − | − | + |
| Short metacarpi | + | + | − | + |
| Brachymesophalangy | + | + | − | + |
| Coxa vara | − | + | − | − |
| Platyspondyly | − | − | + | − |
| Foreshortened vertebrae | − | − | − | + |
| Long clavicles | − | − | + | + |
| Craniosynostosis | − | − | − | + |

[a] P.P., present patient.
[b] +, present; −, absent.

Bondeson, 1993]. The lack of cataract and immune deficiency differentiate the present patient from the syndrome of microcephalic primordial dwarfism and cataracts [Toriello et al., 1986]. Although we cannot exclude that the present single observation is a variety of ODPD types I, II or III, the dissimilarities between this patient and the other ODPD types seem to indicate a new entity. Considering the several clinical and radiological peculiarities, we propose to designate this new condition as ODPD type IV.

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